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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/677,223	10/03/2003	Douglas McGhan	9-13528-207us	8603

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EXAMINER	
STULTZ, JESSICA T	

ART UNIT	PAPER NUMBER
2873	

DATE MAILED: 04/02/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/677,223	MCGHAN ET AL.	
	Examiner	Art Unit	
	Jessica T Stultz	2873	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☐ Responsive to communication(s) filed on _____.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) 1-8 is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) 1-8 is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on 03 October 2003 is/are: a)☐ accepted or b)☒ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☒ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Priority

Acknowledgment is made of applicant's claim for foreign priority based on an application filed in Canada on July 11, 2003. It is noted, however, that applicant has not filed a certified copy of the PCT application as required by 35 U.S.C. 119(b).

Applicant's claim for domestic priority under 35 U.S.C. 119(e) is acknowledged. However, the applications upon which priority is claimed are not provisional applications and therefore applicant cannot claim domestic priority under 35 U.S.C. 119(e) for these non-provisional applications.

Drawings

Figures 2A-C should be designated by a legend such as --Prior Art-- because only that which is old is illustrated. See MPEP § 608.02(g). A proposed drawing correction or corrected drawings are required in reply to the Office action to avoid abandonment of the application. The objection to the drawings will not be held in abeyance.

Claim Objections

Claims 2-3 are objected to because of the following informalities: Regarding claim 2, the claim is not a complete sentence, therefore a period is required at the end of this claim; in claim 3, line 11, "produce the scaled phase value Φ;" should be "produce the scaled phase value Φ';" Appropriate correction is required.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

Claims 1-2 are rejected under 35 U.S.C. 102(e) as being anticipated by Tavlykaev et al.

Regarding claim 1, Tavlykaev et al discloses a method of modulating the E-field of an optical carrier signal (Sections 42-45, wherein the modulator "500" modulates an incoming optical signal, Figure 6), the method comprising steps of: providing a Mach-Zehnder modulator having a pair of independently controllable branches (Sections 42-45, wherein the Mach-Zehnder modulator MZI "501" has independently controlled arms "502" and "503", Figure 6); deriving a pair of independent branch drive signals $V_L(t)$ and $V_R(t)$ (Section 45, wherein the drive signals are "511" and "512", Figure 6); and driving each branch with a respective one of the independent branch drive signals (Section 45, wherein the drive signals "511" and "512" drive phase changes in the modulator arms "502" and "503", Figure 6).

Regarding claim 2, Tavlykaev et al further discloses a step of deriving the pair of independent branch drive signals $V_L(t)$ and $V_R(t)$ comprising steps of: deriving respective phase and amplitude signal component values V_Φ and V_s (Section 45, wherein the drive signals "511" and "512" have both amplitude and phase components); calculating corresponding drive signal values in accordance with the claimed relationship, i.e. wherein the signals are in-phase (Sections 18 and 500, wherein the modulator "500" is an in-phase modulator, Figure 6) and the amplitudes have opposite polarities and the same magnitude (Section 45, wherein the signals have equal magnitude and opposite polarity, Figure 6).

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

Claims 3-8 are rejected under 35 U.S.C. 103(a) as being unpatentable over Tavlykaev et al in view of Essiambre et al.

Regarding claim 3, Tavlykaev et al discloses a method of driving a Mach-Zehnder modulator comprising two branches using two independent drive signals, but does not specifically disclose that the phase and amplitude signal component values are derived by calculating respective phase and amplitude values of the optical E-field, scaling the calculated phase and amplitude values to obtain respective scaled phase and amplitude values, using a phase response of the MZ modulator to calculate the phase signal component value required to produce the scaled phase value, and using an amplitude response of the MZ modulator to calculate the amplitude signal component value required to produce the scaled amplitude value. Essiambre et al teaches of a Mach-Zehnder modulator (Column 2, lines 22-41, wherein the Mach-Zehnder modulator is "204", Figure 2) with two independently controlled arms (Column 2, lines 22-41, wherein the arms are "205" and "207", Figure 2) wherein the drive signals are determined by calculating respective phase and amplitude values of the optical E-field (Column 2, line 22-Column 3, line 25, wherein the phase and amplitude vales of the electric field leaving modulator "202" and entering Mach Zehnder modulator "204" are shown by equation (2)), scaling the calculated phase and amplitude values to obtain respective scaled phase and

amplitude values (Column 2, line 22-Column 3, line 25, wherein the drive voltage is dependent upon the desired phase shift and amplitude change, i.e. the scaled phase and amplitude values), using a phase response of the MZ modulator to calculate the phase signal component value required to produce the scaled phase value, and using an amplitude response of the MZ modulator to calculate the amplitude signal component value required to produce the scaled amplitude value (Column 2, line 22-Column 3, line 25, wherein the drive voltages are determined by equation (3), based on the phase shift and amplitude change in the arms of the modulator) for the purpose of fine-tuning the amount of chirp produced during modulation (Column 3, lines 17-25). Therefore it would have been obvious to one having ordinary skill in the art at the time in the invention was made for the method of Tavlykaev et al to further include the step of determining the phase and amplitude signal component values by calculating respective phase and amplitude values of the optical E-field, scaling the calculated phase and amplitude values to obtain respective scaled phase and amplitude values, using a phase response of the MZ modulator to calculate the phase signal component value required to produce the scaled phase value, and using an amplitude response of the MZ modulator to calculate the amplitude signal component value required to produce the scaled amplitude value since Essiambre et al teaches of a Mach-Zehnder modulator with two independently controlled arms wherein the drive signals are determined by calculating respective phase and amplitude values of the optical E-field, scaling the calculated phase and amplitude values to obtain respective scaled phase and amplitude value, using a phase response of the MZ modulator to calculate the phase signal component value required to produce the scaled phase value, and using an amplitude response of the MZ modulator to calculate the amplitude signal component value required to

produce the scaled amplitude value for the purpose of fine-tuning the amount of chirp produced during the modulation.

Regarding claims 4-8, Tavlykaev et al discloses the method of modulating an E-field as disclosed above, but does not specifically disclose the step of limiting the phase to a range of less than 180 degrees, specifically a range of about 90 degrees, wherein that the phase and amplitude are offset to eliminate trajectories and wherein the amplitude values are limited to 1 or lower. However, Essiambre et al teaches a step of limiting the phase to a range of less than 180 degrees, specifically a range of about 90 degrees (Shown in Figure 3, wherein the phase angle ranges between 90 degrees ($\pi/2$) for the phase shift of π), wherein that the phase and amplitude are offset to eliminate trajectories (Column 3, lines 17-25, wherein the chirp is controlled by the drive signal components) and wherein the amplitude values are limited to 1 or lower (Shown in Figure 3, wherein the amplitude values are limited to 1 or lower) for the purpose of providing a phase shift with tunable chirp (Column 2, line 42-Column 3, line 25). Therefore it would have been obvious to one having ordinary skill in the art at the time the invention was made for the method of modulating an E-field disclosed and taught by Tavlykaev et al to further include a step of limiting the phase to a range of less than 180 degrees, specifically a range of about 90 degrees, wherein that the phase and amplitude are offset to eliminate trajectories and wherein the amplitude values are limited to 1 or lower since Essiambre et al further teaches a step of limiting the phase to a range of less than 180 degrees, specifically a range of about 90 degrees wherein that the phase and amplitude are offset to eliminate trajectories and wherein the amplitude values are limited to 1 or lower for the purpose of providing a phase shift with tunable chirp.

Conclusion

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Ooi et al US 5, 805,321 and 6,606,424, Nakamoto, and Kikuchi et al are cited since they read on or make obvious the present invention, however there were not used in the above rejections because additional rejections would be repetitious. These references disclose a Mach-Zehnder modulator with two independently controlled arms driven by independent drive signals.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Jessica T Stultz whose telephone number is (571) 272-2339. The examiner can normally be reached on M-F 8-4:30.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Georgia Epps can be reached on 571-272-2328. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Jessica Stultz
Patent Examiner
AU 2873
March 26, 2004

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